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A Study of the Nutrition Information on the Labels of Vitamin-Mineral Supplements and Consumer Use of this Information in Korea*

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ABSTRACT

Consumers' frequent use of micronutrient supplements has caused concerns of possible overdoses and prompted the view that the appropriate provision of nutrition information on such supplements is needed. In this study the nutrition information on vitamin-mineral supplements in Korea was evaluated based on the labels on the supplements. Consumers' use, reliance on and demand for nutrition information were examined by self-administered questionnaire. Subjects were 1,203 middle-aged housewives. Under examination were 141 multinutrient products (86.6%) and single nutrient products (13.4%). Various names and units were used for the same nutrient and the labels were not informative to consumers. The mode of nutrients contents in the supplements were several fold of RDA though not in the range of toxicity. %RDA value was seldom shown on the label. Currently these supplements are classified as general drugs in Korea so they are not subject to regulations on nutrition labeling. Half of the subjects read the nutrient content list but two-thirds of them did not understand the information. Numerous health claims related to diseases were listed on the label and more than half of the subjects read them and one-third believed those health claims. These results indicate the need for an appropriate format for nutrition information on vitamin-mineral supplements.

KEY WORDS: Nutrition labeling, vitamin-mineral supplement, health claims.

INTRODUCTION

The efficacy of vitamin and mineral supplements or even the need to take more than the recommended dietary allowance (RDA) has been a contentious subject in the medical and scientific communities. In spite of a lack of consensus on the benefits of vitamin and mineral overdoses, diet supplementation using vitamin or mineral nutrients in the form of tablets, capsules or syrup has been a common practice among members of the public.

Despite remarkable improvements in dietary intakes in Korea, several minor nutrients such as calcium, riboflavin, and zinc are not reaching RDA and many incidents of anemia indicate a lack of iron, folic acid, and vitamin B_{12}, according to national health and nutrition reports (1997, 1999).[1,2]

It is proper to provide these nutrients through natural foods. Nonetheless, because these vitamins and minerals can be scarce in food and can be lost in the course of food processing, because of the availability of synthetic forms at affordable prices, and because of scientific evidence for their functional role in the prevention and management of chronic disease, the use of fortified foods and vitamin-mineral supplements is advocated[3] However, claims of the efficacy of micronutrients in health promotion and disease prevention and management has influenced the public to overconsume these nutrients.

Excess intake of vitamin[4] and minera[5] nutrients can cause toxicities and even those that don't are known to interfere with the bioavailability of others. For example, high calcium intake reduces the bioavailability of iron[6,7] and zinc and excess vitamin E reduces the vitamin C level in plasma.[8,9] Balance in nutrient intake is important and warnings against overdosing on these nutrients is required. Recently many studies on tolerable upper intake levels have been reported.[10-12] On the other hand, dramatic increases in fortified food with these micronutrients[13] and the habitual use of vitamin-mineral supplements has prompted concern among medical professionals. Appropriate guidelines and education on the use of vitamin-mineral supplements are a must. Nutrition labeling (NL) could play a role in guiding food selection and the purchase of vitamin-mineral supplements.

Many previous studies examined the prevalence of vitamin-mineral use and the demographic characteristics of users.[14-16] No study was found that evaluated either the vitamin-mineral supplement products in terms of type,

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dosages and nutrition information or consumers' views of the nutrition information. The contents of individual nutrient products and health claims need to be provided to consumers in a way that facilitates wise decision-making in the selection of supplements.

In this paper the nutrition information on the labels of vitamin-mineral supplements was evaluated. Consumers' reading of nutrition information on the labels of supplements, their comprehension of it and reliance on it were also surveyed. The results of this study may provide help in the development of nutrition labeling regulations and a chance to discuss the classification of these supplements as either dietary supplements or general pharmaceuticals.

MATERIALS AND METHODS

1. Collection of the labels on vitamin and mineral supplements and analysis of nutrition information

Students in the Food and Nutrition Department collected the labels of vitamin and mineral supplements from March 1996 to December 1998. From the information on the ingredient lists and usage directions, the products were classified as single vitamins, mineral supplements or multiple nutrient supplements. A total of 146 products were analyzed for nutrient content, dosage, unit of dose and health claims. Any doubts as to content were taken up with the product manufacturer. Imported products and products from health food manufacturers were excluded since these products are classified as food and they bear the nutrition label required by The Standard for Food Labeling in Korea.[17]

2. Consumer survey

The subjects were 1,203 housewives living in the cities of Seoul, Taegu and Suwon. Their social status was middle to upper middle class with highly educated backgrounds. A self-administered questionnaire was employed to examine their intake of supplements, use of nutrition information, comprehension, and the demand for %RDA. The questionnaire was given out in February 1998. Detailed contents of the questionnaire are found in a previous paper.[18] All of the questions on the nutrition information are made to answer by 5-points Likert Scale. The data are presented as frequency, percentage, mode, and mean ± standard deviation (SD).

Table 1. Type and proportion of current vitamin-mineral supplements in Korea

Product type	Number (%)	
Single nutrient product	19 (13.4)	
Vitamins		16 (11.3)
Minerals		3 (2.1)
Multinutrients product	122 (86.6)	
Antioxidant vitamins		5 (3.5)
Single mineral + vitamins		20 (14.2)
Multivitamins		62 (42.9)
Multiminerals		4 (2.8)
Multivitamins + multiminerals		31 (21.9)
Total		141 (100.0)

RESULTS AND DISCUSSION

1. Classification of vitamin-mineral supplements examined

A total of 148 products were evaluated, as shown in Table 1. Multivitamins made up 43.9% of the total and mixtures of multivitamins and minerals, 21.9%. Multinutrients products were 2/3 of the supplements examined in this study. There were 1,170 vitamin supplements registered for production permission in 1996 and actual production reported in 1998 was 359.[19] Among them, 151 products were multivitamins.[19] These data indicate that the life span of an individual product is short. The present study examined approximately 40% of the products now on the market.

Single vitamins and single minerals made up only 11.3% and 2.1% of the total, respectively. Compared to other countries, the proportion of multivitamin products was greater than single micronutrient products. A report by Park[20] indicated that the distribution of single nutrient and multiple nutrient supplements in the US was 55% and 45%, respectively. Considering a specific nutrient's function in health and disease prevention, production of single nutrient supplements needs to be promoted. Mineral supplements made up of major minerals plus supportive vitamins, such as iron plus folic acid and vitamin B_{12}, calcium plus vitamin D_3 and selenium plus antioxidant vitamins, accounted for 14.2% of all products. Multiple mineral supplements were limited to less than 3% of 146 products examined in this study. This proportion is similar to that in the US.[20]

2. Information on the nutrients contents

Vitamin and mineral supplements classified as general pharmaceuticals do not have a special format to present their nutrient content. The ingredient list on labels contains the names of ingredients and the quantitative content of each ingredient. The ingredient list shown in Table 2 contains retinylpalmitate, cholecalciferol. nitric thiamin,

hydrochloric pyridoxine and panthothenic calcium, most of which are unfamiliar to consumers. For vitamin B_1, 9 different ingredient names were listed. Even collage students who major nutrition could not figure out that panthothenic calcium is the ingredient for either calcium or panthothenic acid. Only some of the products listed common vitamin names along with ingredient sources. Table 3 shows the name and content unit for minerals of the supplements. A simple unified name for each vitamin and mineral nutrient would be more informative and these names need to be in accordance with those in nutrition labeling for foods.

To declare the potency of vitamin and mineral different units were used from product to product. As shown in Table 2, for vitamin A 80% of products used IU and 20% used mg. RE (retinol equivalent) or ug is the formal unit for Vitamin A in the scientific community and Korean RDA is expressed in RE (ug retinol equivalent). Standard Nutrient Values for nutrition labeling in Korea are established in the unit RE.[21] Internationally, including the US and Japan, the unit of vitamin A for NL in supplements is commonly IU. For applicable purposes in daily use, one single unit for each nutrient is needed, whether it be IU or mg. The units for vitamin D and E, other lipid soluble vitamins are in the same situation. Water-soluble vitamins and minerals are noted with mg or ug. Vitamin-mineral supplements in the US commonly use %US RDA unit, which account for 75–85% of all in use.[20] A few products in the present study carried %RDA value, which may be a functional guide to dosage. The examination of current vitamin and mineral supplement labels revealed that the name, the order of listing and unit of micro nutrients are neither familiar nor informative for consumers. A more consumer-oriented, internationally acceptable format is required to provide quantitative nutrient information.

Table 2. Name and content unit for vitamins in the supplements in Korea

Vitamins	Unit for content	Ingredient name
Vitamin A	mg IU	Vitamin A, Acetate-retinol Retinyl palmitate, Retinol
Vitamin D	mg μg	Vitamin D_2, Vitamin D_3 Cholecalciferol, Ergocalciferol
Vitamin E	mg IU	Vitamin E, Tocoferol, Acetate tocoferol, Tocopherol acetate
Vitamin B_1	mg	Vitamin B_1-HCl Thiamin Thiamin propydisulfide Flucialthiamin Thiamin HCl Thiamin HNO3 Rocoat thiamin nitrate Thiamin mononitrate Nitrate thiamin
Vitamin B_2	mg	Vitamin B_2, Riboflavin Tetrabutiric-riboflavin Rocoat riboflavin
Niacin	mg	Rocoat nicotinamide Nicotinamide
Vitamin B_6	mg	Vitamin B_6, Pyridoxine HCl Pyridoxine Hydrochloride P-HCl, HCl pyridoxine Phosphopyridoxine Rocoat HCl pyridoxine
Vitamin B_{12}	mcg mg μg	Acetohydoxy cobalamine cyanocobalamine Vitamin B_{12}
Pantothenic acid	mg	Ca-pantothenate Pantothenic calcium
Vitamin C	mg	Ascorbate Jepia ascorbic acid Vitamin C Calcium ascorbate
Folate	mg μg	Folic acid

3. Evaluation of nutrient content in vitamin and mineral supplements

In Table 4, the mode and range of potency for each vitamin in the products examined are shown as values on the label and %RDA. The weights of ingredients on the label were sum of the specific nutrient and nonnutrient chemical compounds weight. Most labels indicate that the percentage of each ingredient originated from the specific

Table 3. Name and content unit for minerals of the supplements in Korea

Minerals	Unit for content	Name of ingredient
Ca	mg	Ca, Calcium, Anhydoxyphosphomonohydro calcium, CaHPO4
P	mg	P, Phosphate
I	mg	I, Iodine
Fe	mg μg	Fe, Iron, Fumaric ferrous Ferrous fumarate
Cu	mg	Cu, Copper Anhydroxysulfuric copper
K	mg μg	K, Hydrokarum, KCl
Zn	mg	Zn, Sulfuric zinc
Mg	mg	Mg, Magnesium, Hyroxymagnesium Oxymagnesium
Mn	mg	Mn, Manganese, Oxymanganese
Se	mg	Se, Selenium

nutrients, thus it is possible to estimate the quantitative value of the specific nutrient. %RDA per tablet or capsule is an indicator for the potency of individual nutrients. It was calculated by reference RDA, namely adult male Korean RDA. When the nutrient did not have an established Korean RDA, the US RDA value was used. In cases where no known RDA was present, the lower value of estimated safe and adequate daily dietary intake (ESADDI) was used.[22]

The mode potency of fat soluble vitamins, vitamin A, D, and E were around 150-200% RDA. The figures for vitamin C, vitamin B and folate were 910%, 333-770% and 160%, respectively. As listed above, most of the mode values were severalfold higher than Korean RDA. Previous studies with middle-aged subjects[15] and elderly subjects[16] reported that average intake of nutrients by supplement was much higher than the mode values shown in Table 4. The average values reported were 400%, 630%, and 1,700% for vitamin E, vitamin B_1, and vitamin C, respectively.[15][16] The vitamin and mineral supplements under the health food category are frequently composed of single nutrients and are more potent than multiple or mixed supplements. The products from the US were wide-ranging in their potency. The single nutrient product median potency of the vitamins ranged from 125% of US RDA for folate to 6,667% for thiamin. For fat-soluble vitamins A and D, the figure was 200-400%. It was 1,333% for vitamin E. General multivitamins (vitamins A, D, E and folate) were in the range of 100% of US RDA. The numbers were 333%, 294% and 205% of US RDA for thiamin, riboflavin, and vitamin B_6, respectively. Though a direct comparison is difficult, multivitamins in Korea appear to contain high doses of nutrients. The range of dose varied remarkably from 2% to 23,000% for vitamin B_1. Other vitamins were similar in their dose ranges.

The potency of the minerals studied is listed in Table 5. As compared to vitamin nutrients, they were formulated in much lower dosages, with the mode value being less than 100% of RDA. The upper range did not exceed 200% of RDA, except in the case of iron. The dosage range for iron was 12.5-540% of RDA, as shown in Table 5. The previous paper reported the range for iron intake was 230-2,300% of RDA and the average intake was 600% of RDA, which were severalfold higher than the present data.[16] The reason for this may be the same as vitamins described above. The study by Park[20] also reported that the potencies for minerals were generally low-

Table 4. Dose of vitamins in the vitamin-mineral supplements in Korea

Nutrient	Number[1]	Mode of potency (N[1], %RDA[2])	Range of potency/tablet (%RDA[2])
Vitamin A	50	5000IU (16, 167%RDA)	90 - 25000IU (3 - 835)
Vitamin D	51	400IU (27, 200%RDA)	40 - 500IU (20 - 250)
Vitamin E	74	30IU (16, 200%RDA)	0.4 - 400IU (2.7 - 2667)
Vitamin B_1	76	10 mg (17, 770%RDA)	0.25 - 300 mg (19.2 - 23100)
Vitamin B_2	81	10 mg (19, 666%RDA)	0.787 - 30 mg (52.4 - 2000)
Niacin	69	100 mg (14, 588% RDA)	1.6 - 100 mg (9.4 - 588)
Vitamin B_6	80	5 mg (11, 333% RDA)	0.25 - 50 mg (16.6 - 3333)
Vitamin B_{12}	64	18 μg (7, 750%RDA*)	1 - 522 μg (41.7 - 21750)
Folate	38	400 μg (19, 160%RDA)	0.15 - 400 μg (0.06 - 160)
Pantothenic acid	39	10 mg (12, 200%RDA*)	1.67 - 25 mg (33.4 - 5000)
Vitamin C	81	500 mg (19, 910%RDA)	10 - 750 mg (19 - 1365)

1) Product number examined
2) The reference value for %RDA was the 6th korean RDA of male adult
* : The reference value for %RDA was USRDA and Daily Reference Intake (DRI, 1997) of USA

Table 5. Dose of mineral nutrients in the vitamin-mineral supplements in Korea

Nutrient		Mode of Potency (N[1], %RDA[2])	Range of Potency / Tablet (%RDA)
Calcium	(31)[1]	500 mg (3, 71% RDA)	26.5 - 1250 mg (3.8 - 178)
Iodine	(16)	150 μg (13, 100% RDA*)	150 μg (100)
Chromium	(6)	15 μg (5, 31% RDA**)	15 - 25 μg (31 - 50)
Copper	(18)	2 mg (10, 100% RDA*)	1 - 3 mg (50 - 150)
Iron	(32)	18 mg (7, 150% RDA)	1.5 - 65 mg (12.5 - 542)
Magnesium	(18)	100 mg (10, 25% RDA*)	1.6 - 150 mg (0.4 - 38)
Selenium	(16)	10 μg (7, 14% RDA*)	10 - 50 μg (14.3 - 71)
Zinc	(29)	15 mg (12, 100% RDA)	0.03 - 25 mg (0.2 - 167)

1) Product number examined
2) The reference value for %RDA was the 6th korean RDA of male adult
* : The reference value for %RDA was USRDA and Daily Reference Intake (DRI, 1997) of USA
** : The reference value for %RDA was lower level of Estimated Safe and Adequate Daily Dietary Intake (50 - 200 ug for Cr)

er than those for vitamins. Median potencies of mineral supplement intakes ranged from 30% of US RDA for calcium to 278% of US RDA for iron in the case of a single nutrient product. The mode values for minerals in multinutrient supplements were similar to those in this study, showing less than 100% of US RDA. The range of dosages was 0.5 – 667% of US RDA.[20]

The urge of consumers to take more of a pertinent nutrient and their ignorance of toxicities by overdose prompted health professionals to establish the tolerable upper level intake (UL). Recently Nordic,[23] Japan and the US set ULs in their RDAs (or DRI) and they provide this information to the public. A paper by Kim[24] summarized the toxic dose range for various vitamins and minerals. From her data and the data in Nordic nutrition recommendations,[23] it was confirmed that supplements currently on the Korean market seldom contain any nutrients in the toxic dose range in a single tablet. However, consumers' perception that more is better for certain nutrients and the rapid prevalence of fortified foods prompted professionals to pay greater attention to the consumption of micronutrient supplements. The Joint Committee on Food Hygiene Investigation in Japan proposed maximum levels for 14 vitamin and minerals in the nutrition supplements, which are in the category of health food, but with extraordinary forms such as tablets and capsules.[25] The proposed levels are approximately half of the mode values for vitamin A, D, and folate and for other vitamins they range from 200% to severalfold higher than the mode levels in this study. For calcium and iron, 100% of RDA is suggested. These relatively lower dosages may alleviate the overconsumption of micronutrients.

4. Health claims on the labels of vitamin and mineral supplements

The pharmacological function, efficacy, and specificity of the supplements shown on the label are defined as health claims in this study. The terms used on the products were too numerous to mention. These claims tell of the products' effectiveness at combating specific micronutrient deficiencies, effectiveness in the prevention of chronic diseases and cancers, effectiveness at providing nutrients and promoting health at special times of life, such as during pregnancy and lactation, effectiveness with children and the elderly, effectiveness at relieving chronic fatigue and increasing stamina, and effectiveness at preventing virtually all known diseases. For multivitamins, their efficacy at fighting diabetes, heart disease, hypertension, atherosclerosis, hypercholesterolemia, and many other disease symptoms were commonly listed. Under current food labeling regulations in Korea, these disease-specific claims are not allowed with vitamin-mineral supplements in the health food category and for vitamin- or mineral-fortified processed foods. Internationally, disease-related health claims are not allowed for foods unless data on the incidence rate of the diseases are provided and the functional mechanism of the special nutrient with respect to a disease is substantiated.[26,28] In the US, 8 health claims related to disease prevention and treatment are currently allowed.[29] But the usage of terms is very limited and, without total agreement among professionals, a conclusive message cannot be shown on the label. In the case of calcium and osteoporosis, special phrases such as 'Calcium may reduce the high risk of osteoporosis later in life' are allowed in addition to expressions of other contributing factors such as regular exercise and a healthy diet. Also required are comments like 'Daily intake above 2,000 mg is not likely to provide any additional benefits.'[30] Numerous health claims have been allowed for supplements in Korea because of the general classification of vitamin and mineral supplements as general pharmaceuticals. The previous survey showed that 86% of consumers took vitamin and mineral supplements as nutrients and not as pharmaceuticals.[31] And many countries classify vitamin and mineral tablets or capsules as dietary supplements, except high potency supplements which can be obtained only with a doctor's prescription.[20,25,32] The classification of these vitamin-mineral supplements should be examined before regulations on health claims are discussed.

5. Consumers' use of nutrition information, comprehension and demands for %RDA on the labels of vitamin-mineral supplements

A total of 853 housewives from among 1,203 subjects took supplements in the last six months. The ratio of users to the total is approximately 70% and this value is a little greater than those in others' reports, which were 41%[15] and 45%[16] for adults and the elderly in Korea, respectively. The subjects in this study, highly educated, middle- to upper-class housewives, appear to be more prone to take supplements. The demographic characteristics of the users and non-users of supplements were the same. Detailed data on the subjects is found in the previous paper.[18] Classification of the supplements used by subjects is listed in Table 6. The pattern of their use was the same as that of the products on the market (Table 1).

As shown in Table 7, the subjects in this study did not closely read ingredient labels. An average value of 3.36

Table 6. Type and proportion of supplements taken by middle-aged housewives

Type	Number[1] (%)
Multivitamins	258 (33.1)
Vitamin B Complex + Vit. C	226 (28.9)
Calcium + Vitamins	161 (20.6)
Antioxidant Vitamins	11 (1.4)
Antioxidant Vitamins + Se	8 (1.0)
Iron	81 (10.4)
Calcium	93 (11.9)
Others	14 (1.8)
Total	853 (100.0)

1) *umber of subjects who took vitamin-mineral supplement in the last 6* month

Table 7. Consumers[1] reading and understanding of nutrient content on the label of supplements

Items	Answers	N[2] (%)	
Reading the contents of nutrients	Absolutly no (= 1)	21 (2.3)	
	No (= 2)	168 (18.3)	
	So and so(= 3)	259 (28.2)	3.36 ± 0.94[3]
	Yes (= 4)	403 (43.8)	
	Absolutly yes (= 5)	69 (7.5)	
Understanding the contents of nutrients	Absolutly no (= 1)	17 (1.8)	
	No (= 2)	133 (14.4)	
	So and so (= 3)	500 (54.2)	3.13 ± 0.74
	Yes (= 4)	256 (27.7)	
	Absolutly yes (= 5)	17 (1.8)	

1) middle-aged housewives, 2) N: the number of subjects
3) mean ± SD

was found, closer to so-so (= 3) than yes (= 4) under the 5-point Likert scale. A total of 43.8% of subjects answered 'yes (= 4)'. The degree of comprehension of the nutrient content was 3.13, indicating their poor understanding of the quantitative information More than half (54.2%) of the subjects answered so-so with respect to their comprehension. Accordingly, 30.8% of them judged the dosage of supplements was not sufficient, though the dosage in most of the vitamins was severalfold higher than RDA. Over half of them read the health claims but their belief in the health claims was 'so-so', as indicated in Table 8. These responses are commonly found in consumer studies on nutrition labeling. In Sim[28] two major problems for nutrition educators were noted, namely 1) consumers' difficulty in using quantitative information on labels and 2) consumers' poor comprehension of health claim information.

On the question of the possible inclusion of %RDA value in the ingredient content information, 58.8% of subjects agreed. They answered understand (45%) or 'so-so' (35.3%) to the %RDA value, as shown in Table 9. In spite of the uncertainty of their understanding of %RDA, 64.5% of the subjects intended to confirm the %RDA information (Table 9). These responses indicate that consumers wanted to know %RDA values and intended to confirm %RDA at the point of purchase.

Table 8. Consumers[1] reading and Reliability of health claims on the label of supplements

Items	Answers	N[2] (%)	
Reading the health claims	Absolutly no (=1)	11 (1.1)	
	No (= 2)	104 (10.7)	
	So and so (= 3)	259 (26.6)	3.54 ± 0.80[3]
	Yes (= 4)	551 (56.5)	
	Absolutly yes (= 5)	50 (5.1)	
Reliability of health claims	Absolutly no (= 1)	10 (1.0)	
	No (= 2)	120 (12.3)	
	So and so (= 3)	535 (54.7)	3.00 ± 0.69
	Yes (= 4)	306 (31.3)	
	Absolutly yes (= 5)	7 (0.7)	

1) middle-aged housewives, 2) N: the number of subjects
3) mean ± SD

Table 9. Consumers[1] use and understanding of %RDA as nutrition information on the label of supplements

Items	Answers	N[2] (%)	
Pro on %RDA value	Absolutely no (=1)	8 (0.8)	
	No (= 2)	40 (4.1)	
	So and so (= 3)	267 (27.2)	3.71 ± 0.72[3]
	Yes (= 4)	577 (58.8)	
	Absolutely yes (= 5)	89 (9.1)	
Understanding on %RDA value	Absolutely no (= 1)	13 (1.3)	
	No (= 2)	136 (13.9)	
	So and so (= 3)	345 (35.3)	3.36 ± 0.81
	Yes (= 4)	450 (46.0)	
	Absolutely yes (= 5)	34 (3.5)	
Confirming %RDA value at purchase	Absolutely no (= 1)	9 (0.9)	
	No (= 2)	53 (5.4)	
	So and so (= 3)	196 (20.0)	3.75 ± 0.73
	Yes (= 4)	631 (64.5)	
	Absolutely yes (= 5)	89 (9.1)	

1) middle-aged housewives, 2) N: the number of subjects
3) mean±SD

The inclusion of %RDA values on labels and consumer nutrition education on RDA would facilitate the use of nutrition information given. Recently, the Korean Nutrition Society and the Food and Drug Administration established nutrient standard values (NSV) as a single RDA value, namely, female adult RDA value.[21] Newly established nutrient standard values are for nutrition labeling as daily values(DV) in USA.[22] These NSV need to be provided to the public and their use in nutrition labeling should be promoted.

In conclusion, vitamin-mineral supplement labels need to bear clearer nutrition information in terms of names, be uniform in terms of units, and be more understandable to consumers in terms of the recommended dosage.

Supplement Facts Serving Size 1 Tablet					
Amount Per Tablet		%Daily Value	Amount Pre Pocket		%Daily Value
Vimanin A (from fish liver oil)	5,000 IU	100%	Zinc (as zinc oxide)	15 mg	100%
Vitamin C (as ascorbic acid and from rosa fruit)	250 mg	417%	Selenium (as sodium selenate)	25 mg	36%
Vitamin D	400 IU	100%	Copper (as curic oxide)	1 mg	50%
Vitamin E (as d-alpha tocopherol)	50 IU	500%	Manganese (as manganese Sulfate)	5 mg	143%
Thiamin (as thiamin mononitrate)	75 mg	5000%	Chromium (as chromium chloride)	50 mcg	38%
Riboflavin	5 mg	4412%	Molybdenum (as sodium molybdaen)	90 mcg	31%
Niacin (as niacinamide)	75 mg	375%	Potassium (as potassium chloride)	10 mg	< 1%
Vitamin B_6 (as pyridoxine hydrochloride)	75 mg	3750%	Choline (as choline chloride)	100 mg	*
Folate (as folic acid)	400 mcg	100%	Betaine (as betaine hydrochloride)	25 mg	*
Vitamin B_{12} (as cyanocabalamin)	100 mcg	1667%	Glutamic acid (as L-glutamic acid)	25 mg	*
Biotin	100 ncg	33%	Inositol (as inositol monophosphate)	75 mg	*
Pantothenic Acid	75 mg	750%	Rutin (from common buckwheat)	25 mg	*
Calcium(from oystershell)	100 mg	10%	para-Aminobenzoic acid	50 mg	*
Iron (as ferrous fumarate)	10 mg	56%	Deoxyribonucleic acid	50 mg	*
Iodine (from kelp)	150 mcg	100%	Boron	500 mcg	*
Magnesium (as magnesium oxide)	60 mg	15%	*Daily Value not established		

Fig. 1. The example of nutrition information format for the dietary supplements in USA.

The nutrition information listed on Supplement Facts in the US is one outcome of a consumer-friendly system. Fig. 1 shows an example of Supplement Facts. Consumers should be informed of the fact that more is not always better. The appropriate use of vitamin-mineral supplements should be appreciated for their convenience in nutrition intervention to relieve the deficiency or fulfillment of the verified function of micronutrients without changing habitual dietary pattern. Nutritionists in Korea need to appeal to the authority to change the classification of vitamin-mineral supplement to be dietary supplement not pharmaceuticals. And these supplements must be subject to nutrition labeling regulations. Under nutrition labeling regulations, more appreciable, reliable and applicable nutrition information can be provided to consumers and the production of vitamin-mineral supplements can be better regulated.

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